Firm Location Choice

Basics, Anecdotes
and Steelhead

Firm Location Choice

- Firms aim to maximize profit
- One factor influencing profitability is location
- The amount and manner in which location matters varies between sectors and between firms
  - amount has declined generally over the past century
  - matters more to young companies and new industries
  - California has a number of industries where it's key and has increased in importance

Firms v Establishments v Employees

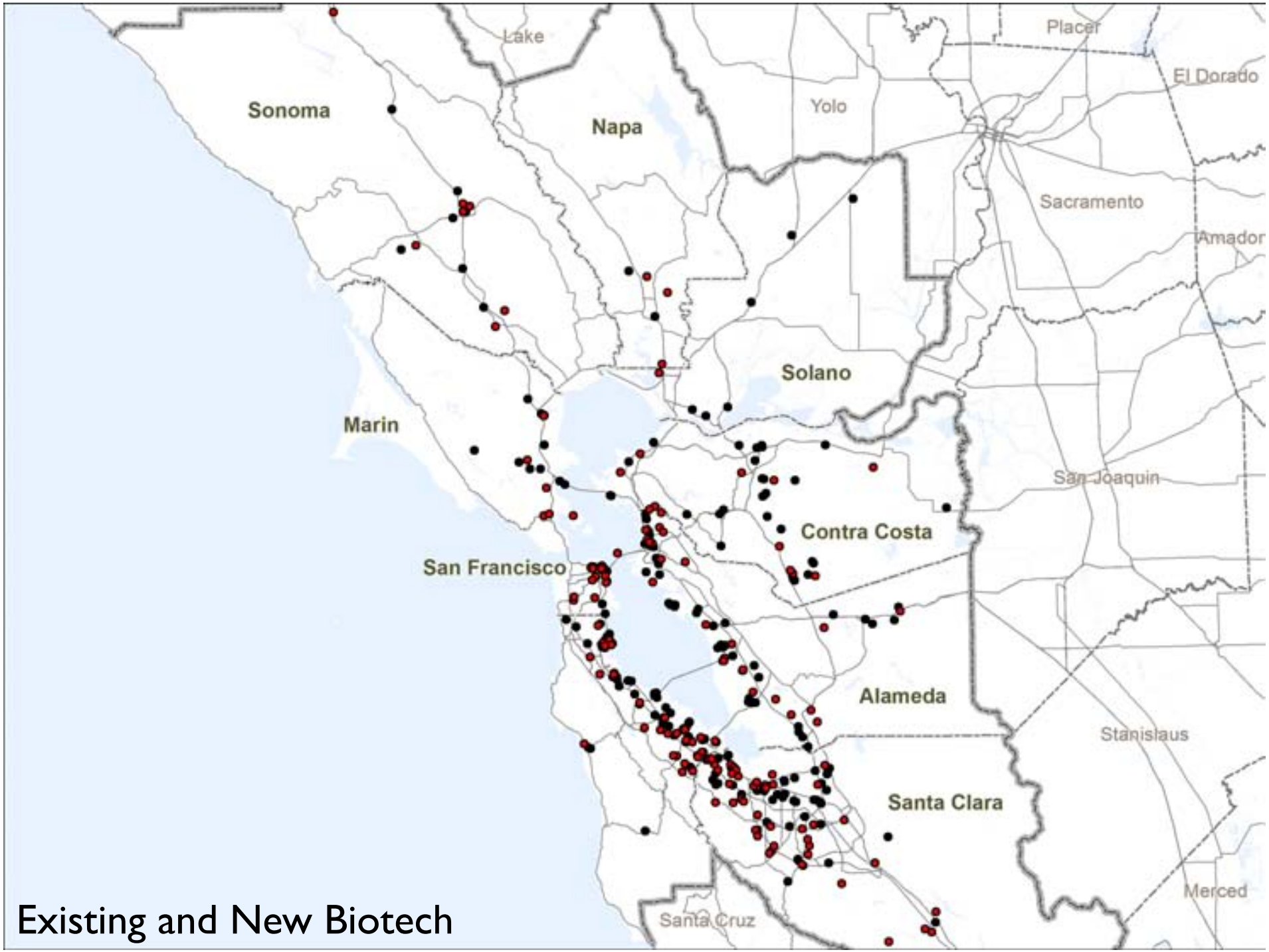
- Teach this like it's a cobbler trying to site shop
  - siting of Zynga or RN74 is somewhat like this
- Urban model covers the entire economy and employee count is our key output
- Firms may consist of multiple establishments (sometimes in a hierarchy) each of which contains employees
- Agents within the firm make location choices about all three within this structure

Scale

- Simultaneous choice at multiple spatial scales
  - Inter-Regional (incorporating national characteristics)
  - **Intra-regional**
  - Jurisdictional
  - Site and building

Pull/Push

- Firm location choice is a trade-off
- Attractors pull a firm toward things that contribute to the firm's profitability
  - City exists to provide proximate economic interaction
- Many good things are craved by many firms so there is crowding
  - High rents and congestion counter and push the firm away



Existing and New Biotech

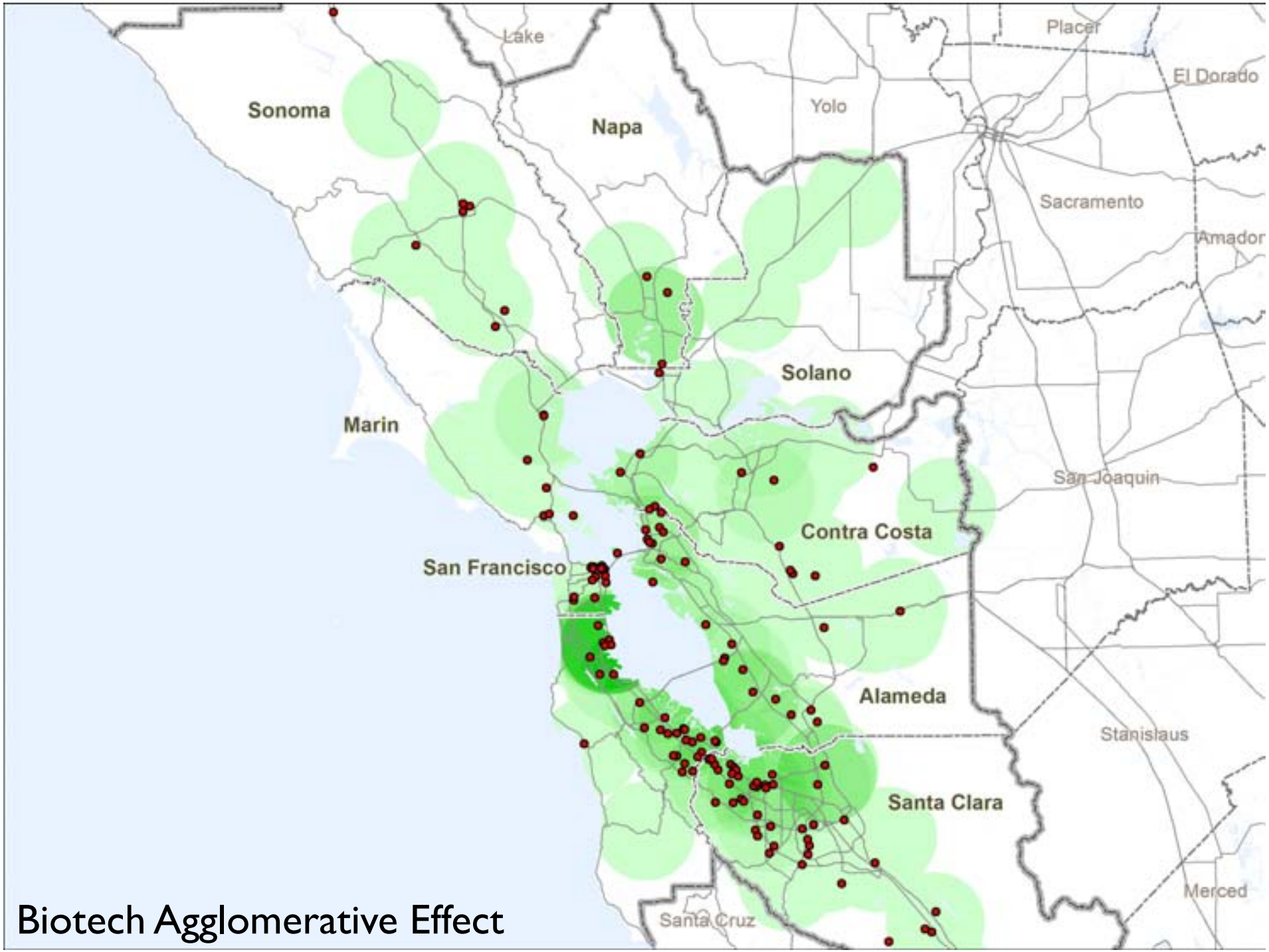
Static Attractors

- Physical things that don't move a lot
- Coal mine → View of Alcatraz
- Seaport → Airport
- Research University (tech)
- Freeway onramp (shipping)
- Freeway Intersection (retail)

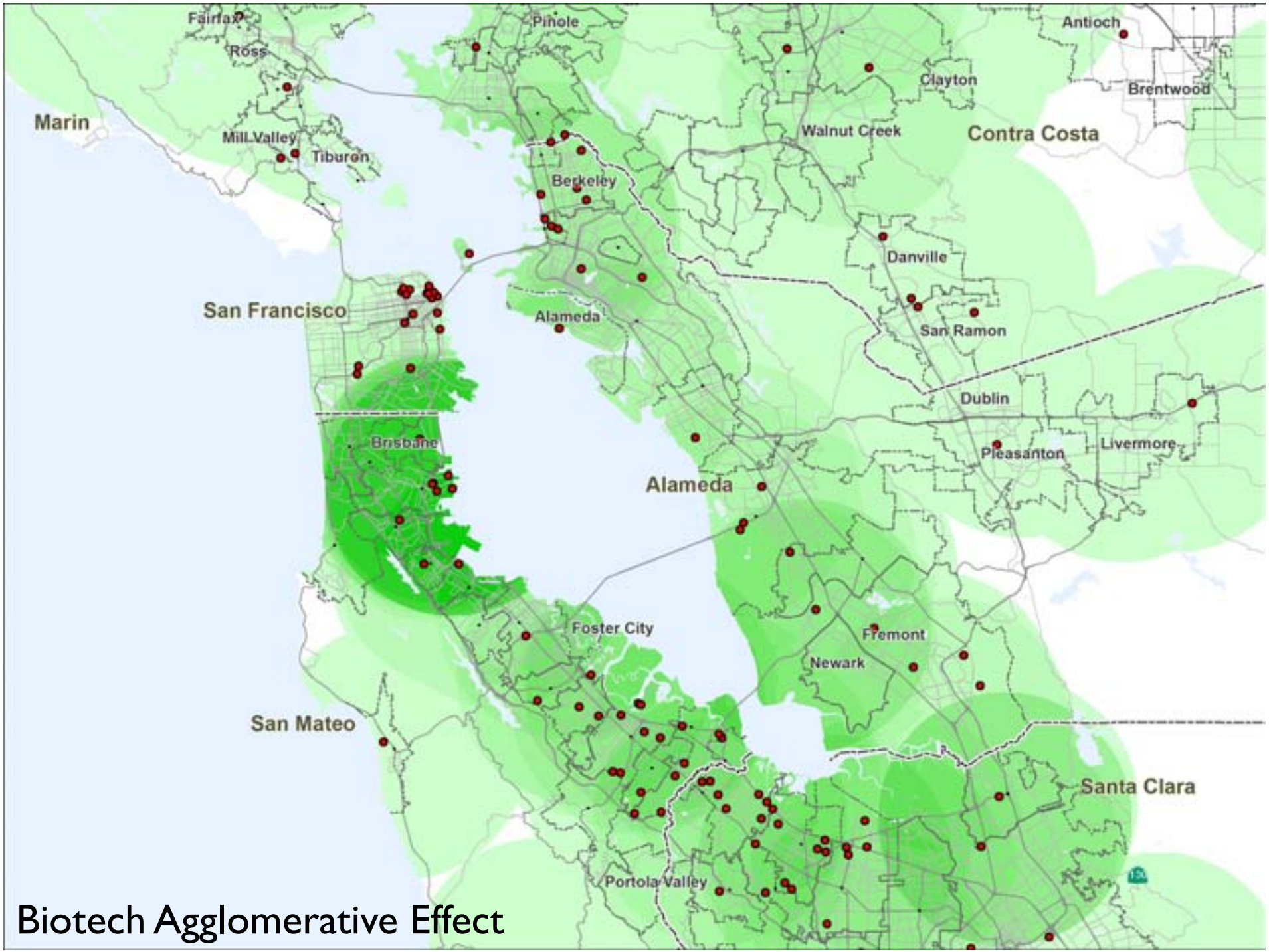
Distance to a Major Airport

Leibnitzian Attractors

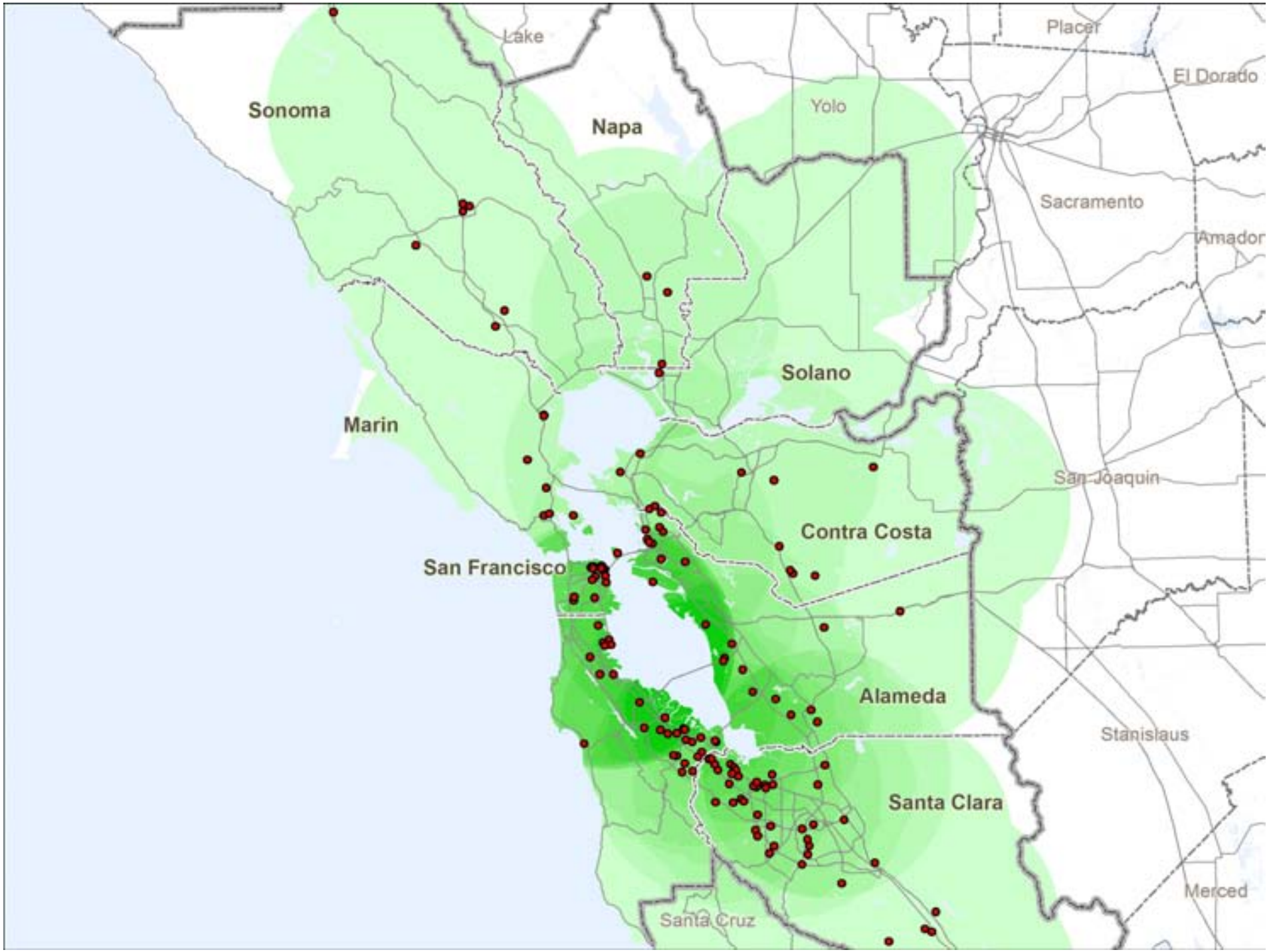
- These clusterings could "happen" anywhere
- Agglomerative economies: benefits gained from being near other employees in the same or a related sector
  - Silicon Valley, SF Financial District, SOMA
  - "the mysteries of the trade become no mysteries; but are as it were in the air" (Marshall 1909)
    → Jane Jacobs, Saxenian, Glaeser
- Linkages: share a lawyer, business hotel, airport
- Comparison shopping: auto rows, antiques corners, *jimbocho*, North Beach



Biotech Agglomerative Effect



Biotech Agglomerative Effect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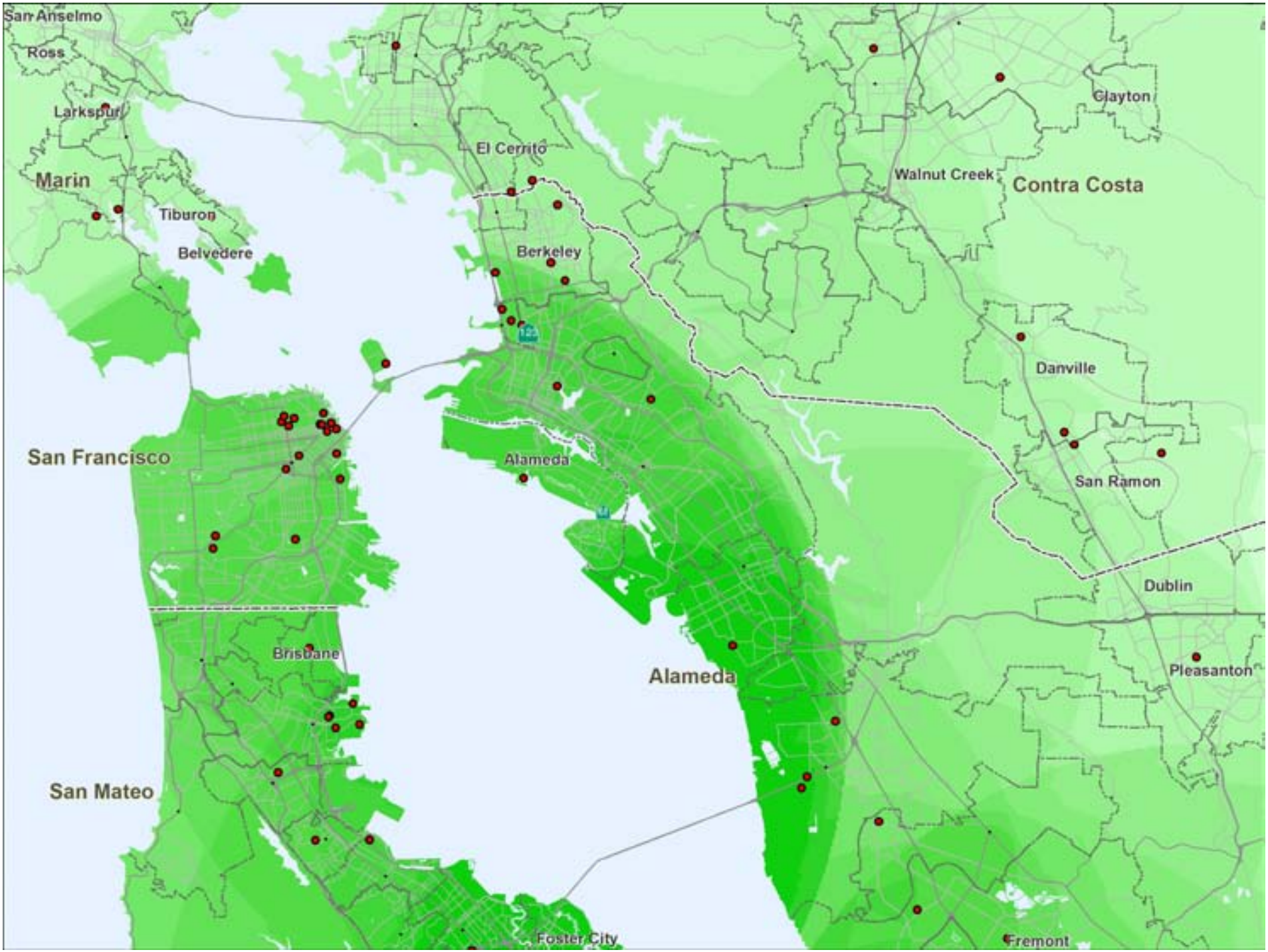
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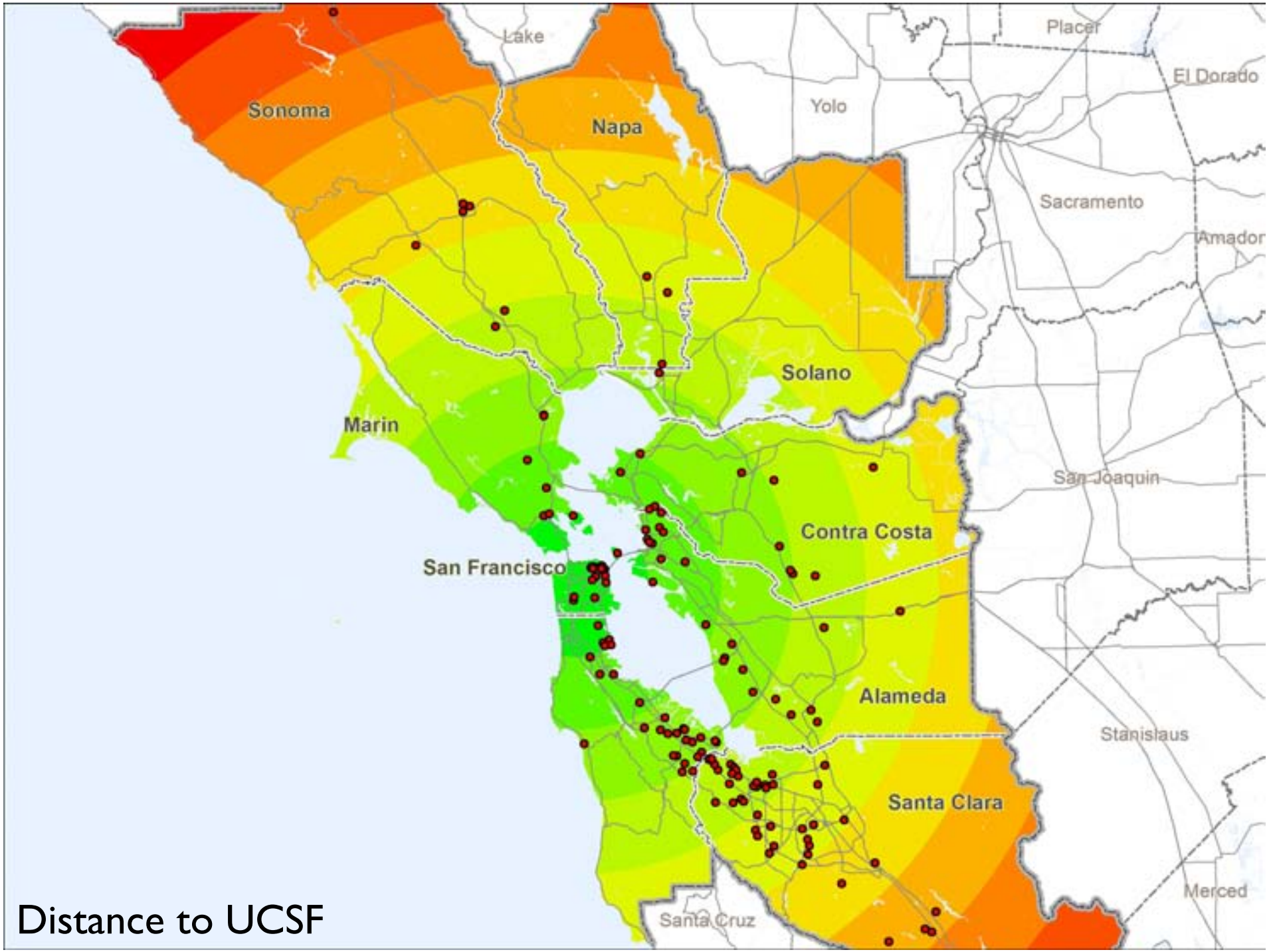
Pleasanton
San Francisco
Alameda
Alameda
Brisbane
San Mateo
Foster City
Fremont

Regional Attractors

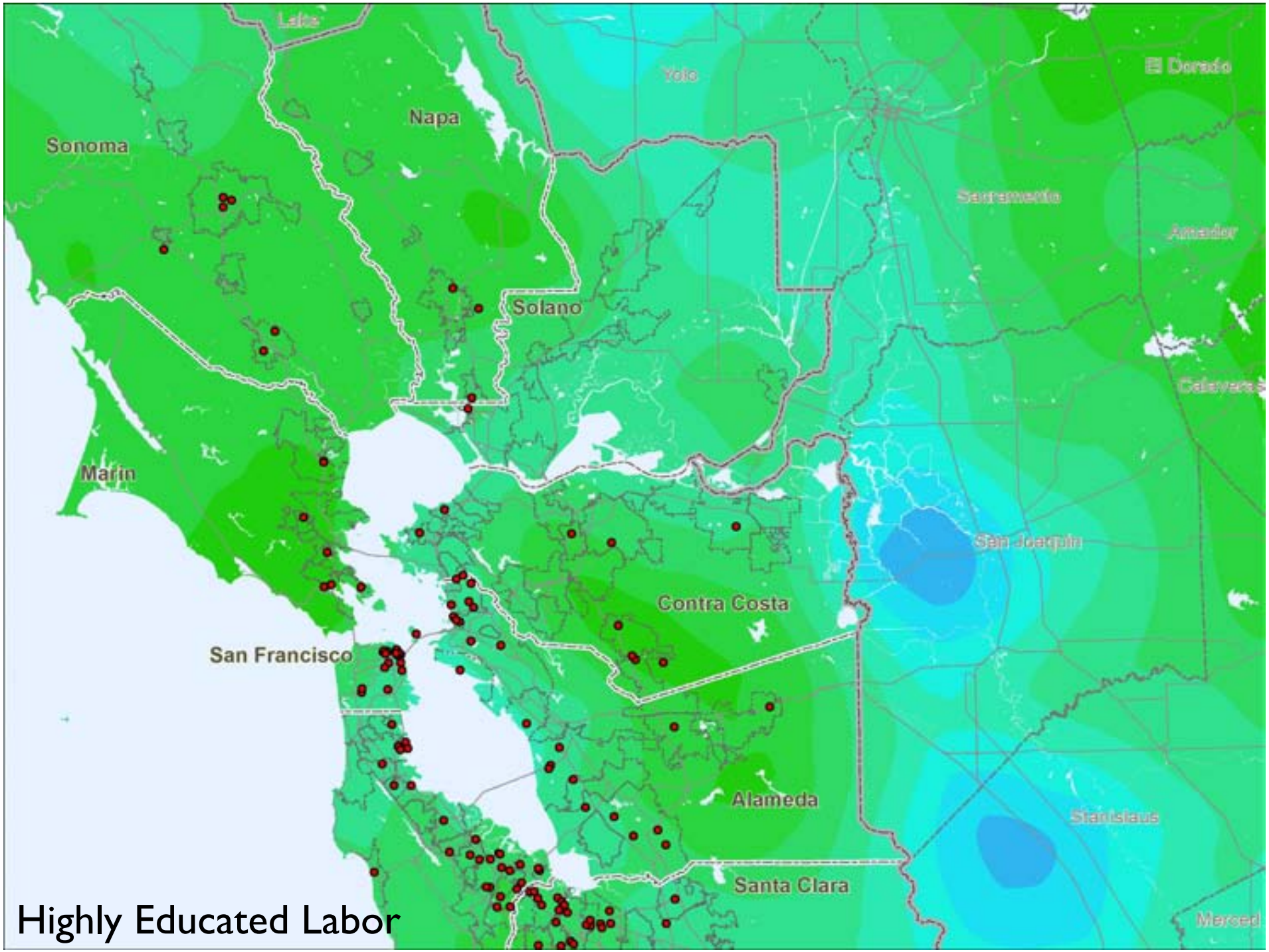
- Sort of a mix
- Most common are trajectories
  - Computers flow out of Stanford or The Garage
  - Bio-tech flows out of UCSF or Genentech
  - High finance flows out of Tadich Grill or the Pacific-Union Club
- Historical search patterns, access to cultural centers, image



Distance to UCSF

Residential Attractors

- Access to labor
  - Want access to right workers
  - More potential workers mean easier transitions and tighter matches
  - Bay Area access to highly specialized labor pools important to tech, web, finance, higher ed
  - Central locations often strong
- Access to markets
  - Decrease the cost of consumer transaction
  - Bakeries, pizza parlors, liquor stores, nail salons, K12 schools
  - Usually dispersed but more central wins for rarer trips (diamond stores, architectural books, Fleur de Lys)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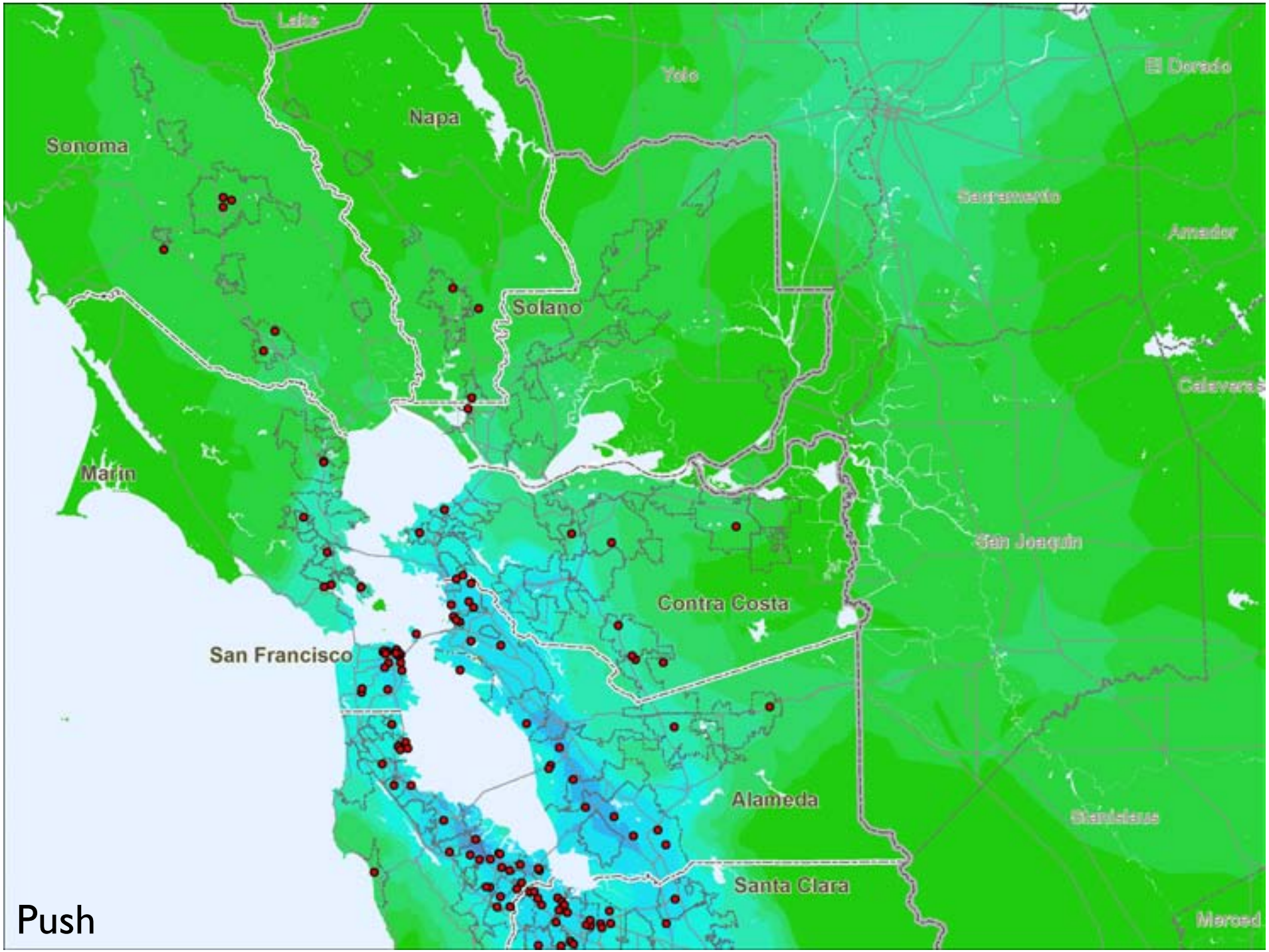
Highly Educated Labor

The Push

- Some variation in ideal locations and how much it matters but a lot of desire for particular areas or areas near enough to those areas
- These hot areas see very high rents
  - Don't want to pay more than it's worth
  - (Leads to taller buildings which mitigates if works for sectors, plan)
- Congestion increases into these locations
  - Quicker commute = lower salary = more profit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San Francisco
Alameda
Santa Clara
Merced
Push

Jurisdiction

- Interacting forces but establishment has to locate within a city or county
- Needs to be enough zoned land
  - Employment land overzoned but not enough in Palo Alto, Berkeley, SF (every ten years)
- Most tax and legal issues are set at CA/US
  - SF can be an exception
  - Tax breaks can work but should be seen within a broader framework → looking for a gap
- Not so common today: Silicon Valley Power

Site and Building

- Functional appropriateness of attractiveness of site and building can matter
  - Either exists or can be built
- Large floorplates
- Brick-and-beam

The Choice

- Firm (that has decided to move) chooses the most profitable empty site and occupies it
- Unless it costs too much
  - No longer the most profitable (net)
  - Means someone else wants it more
  - Move to another good choice
  - A lack of sites in preferred locations leads to shifting to less preferred locations within the region, splitting into multiple establishments, finding a way to occupy less space, or changing regions

Spatial Outcome

- This ongoing sorting mechanism leads to a regional distribution of employment and sqft
- Simultaneously see
  - clustering in a single regional center
  - clustering in sub-centers of varying degrees and types of specialization
  - attraction to particular infrastructures, cultural facilities, populations, natural features, etc
  - dispersion to distant locations with cheap land

Takeaways

- Lots of subtle factors interacting
- Different firms want different things
- Path dependency
  - Regional trajectory
  - Once a clustering happens it is often very durable
    - Patterning of sub-centers through the region
    - Has been very hard to recreate Silicon Valley anywhere

Anecdotes

- Genentech
- Zynga and Twitter
- VISA
- Apple
- Gap
- Kaiser

Genentech

- Spun out of pioneering not-for-profit work at UCSF
- Start up in South City (closest appropriate building then)
- Grown to 11,000 employees and started an industry
- Vacaville site has under 200 workers that do production and distribution
  - No property tax for 10 years, fast tracked, Arnold
  - Looks to be closing for now
- Newer, bigger locations in Oceanside, Portland westside, Singapore and Singapore

Zynga and Twitter

- Part of new wave of web firms that want brick-and-beam and near transit/bike lanes
- SOMA is filling up again—or at least the cool older buildings are
  - Empty FiDi towers are no good ("windows must open")
  - Jackson Square no good
- Tax break to get Twitter to SF Mart
  - Fundamentals are right (geog and building)

Visa

- Had been located in SF Financial District
- Moved to San Mateo County (and a lot of other places for processing)
- Recently moved back around 100 people to Market Street = World Headquarters
- 1000s of employees in Foster City etc
- “Back officing”

Apple

- Has always been in Cupertino
- Strong corporate culture and closed campus
- Second campus just begun 1 mile away
- Don't make anything in CA anymore and are rich so can afford to stay in a very expensive location
  - Exception may be some cutting edge small chips
- Server farms
  - Large one 500K sqft in southeast, tax incentives
  - New one in Santa Clara 11K sqft, why?

Gap

- Corporate at Embarcadero with art collections in and outside
- Bigger office in San Bruno
- Store siting (130K employees total)
  - All about the potential customers
  - Presence near competitors
  - Cannibalization analysis

Kaiser

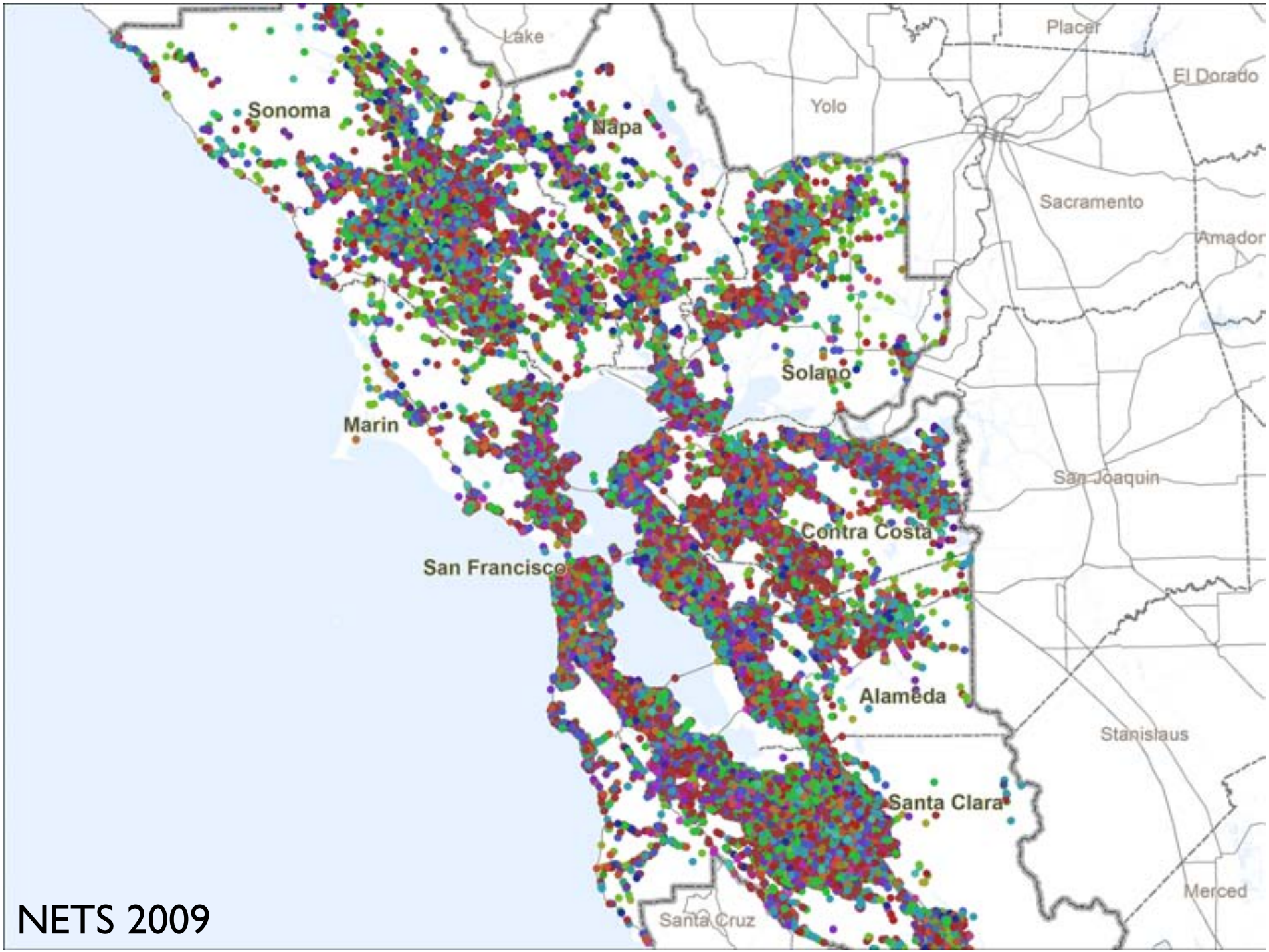
- Strong corporate center in Oakland for historical and cultural reasons
- Older med centers are often part of large, highly accessible medical clusters
- Newer medical centers set off alone but very large (need a lot of land)
- Newer administrative centers aiming for very cheap land and auto-access?

Steelhead

- Don't calculate each firm's profitability
  - Revealed choice as related to attributes of firm and potential locations (as with most transport modeling)
- Dealing with probabilities (where does the CEO live?)
  - Stochastic
- Currently analyzing employees within zones that have good characteristics and space
  - This summer switching to a firm locating employees in an individual building on a parcel
- Using CT-RAMP results for accessibilities → earlier circles will extend out along faster corridors

NETS

- National Employment Time Series dataset
  - Among others
- 20 years of CA establishment locations and each movement (the choice)
- Employees, sales, firm structure
- PB is finishing up cleaning and joining to parcel geodatabase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Stanislaus
Santa Clara
Merced
Santa Cruz

NETS 2009


Push
San Francisco
Union
Macondray
Green
Vallejo
Broadway
Robert C. Levy
Columbus
Kearny
Stockton
Battery
Davis
Ferry Slip
Pacific
Jackson
Washington
Taylor
Codman
Grant
Commercial
Drumm
The Embarcadero
Steuart
Front
Larkin
Hyde
Clay
Pleasant
Mason
Joice
Pagoda
Quincy
Montgomery
Sansome
Beale
Main
Sacramento
California
Pine
Fella
Kearny
Fremont
Spear
Anson
Campton
Stevenson
1st
Austin
Bush
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Jessie
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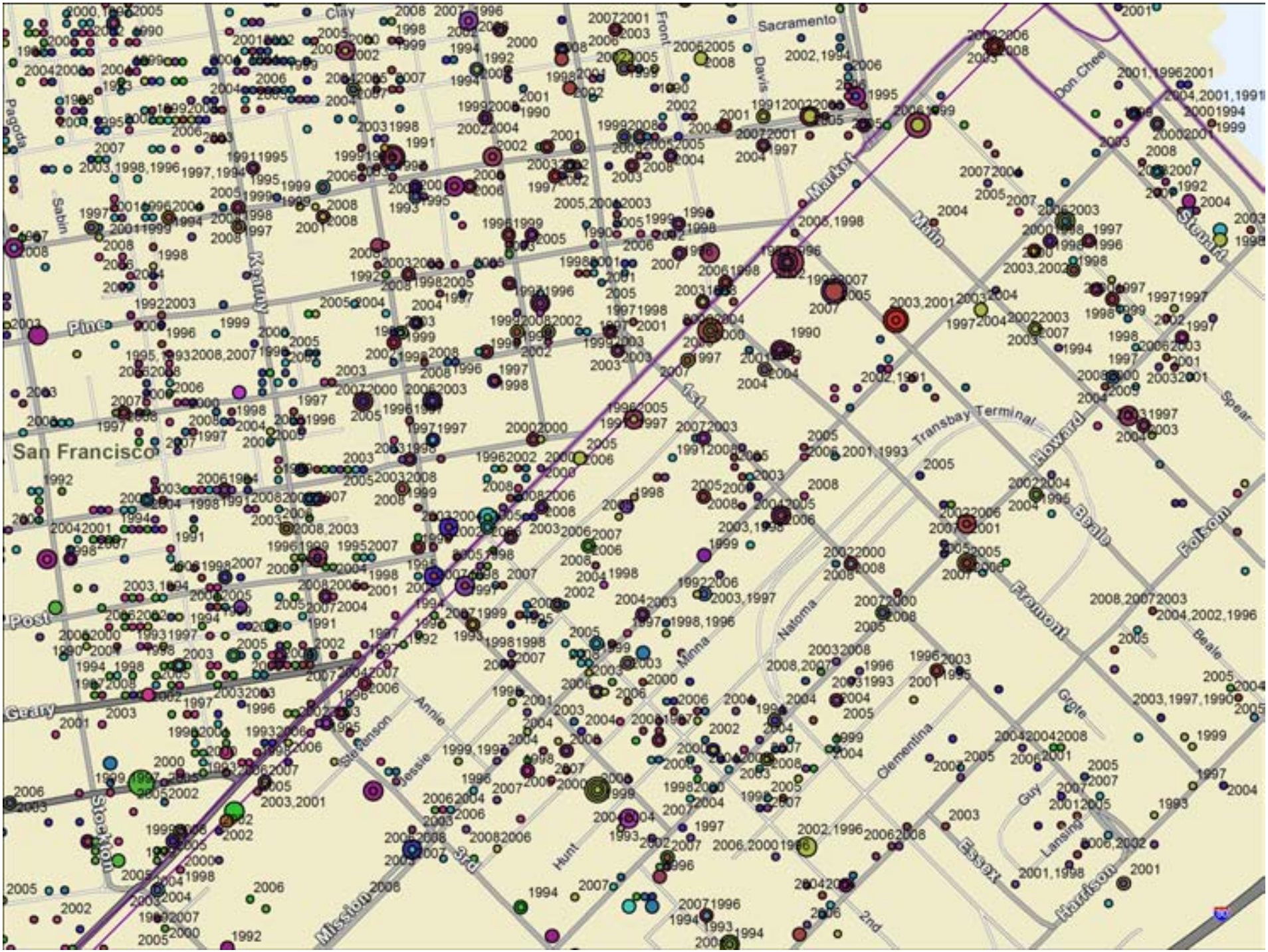
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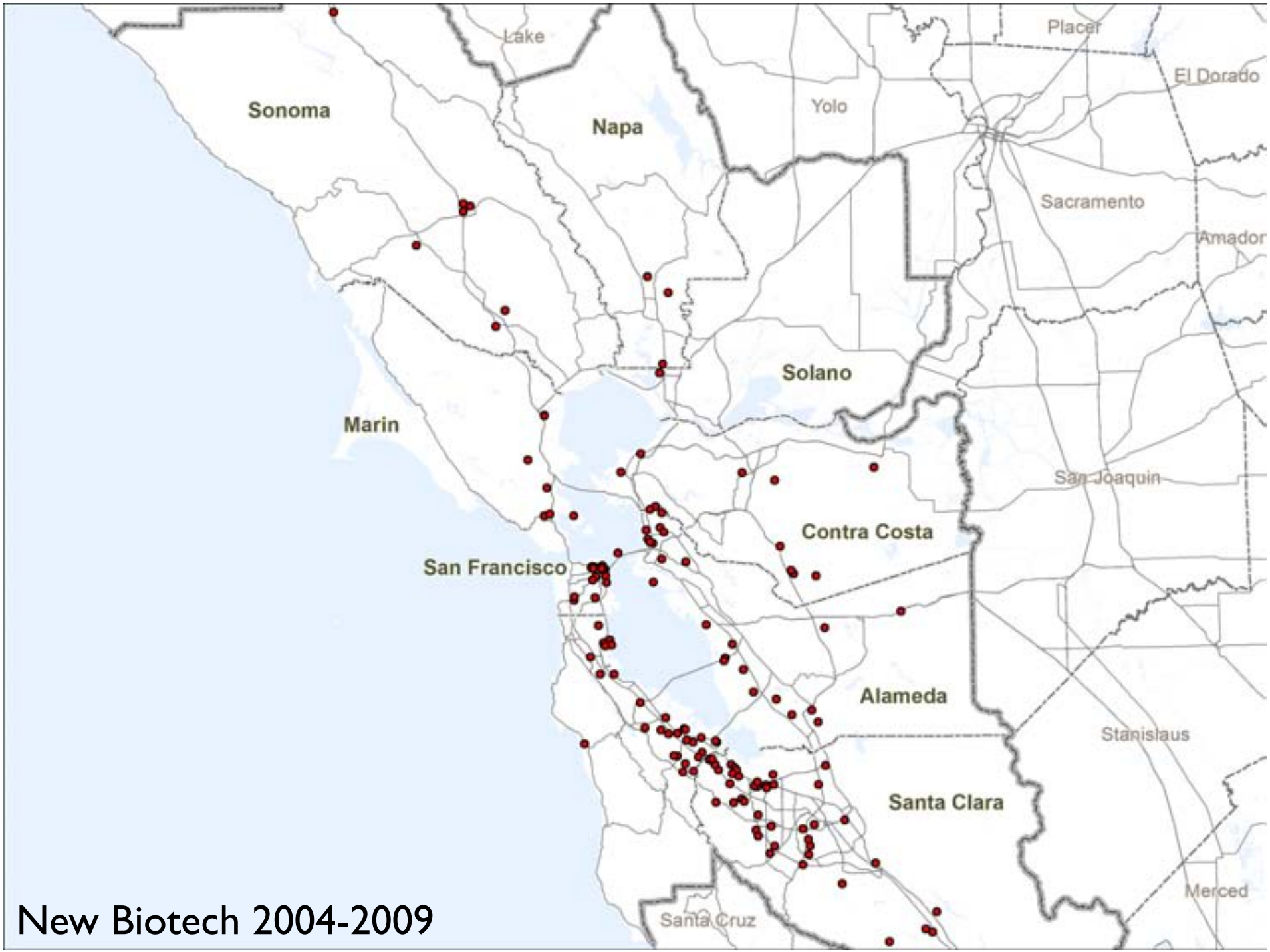
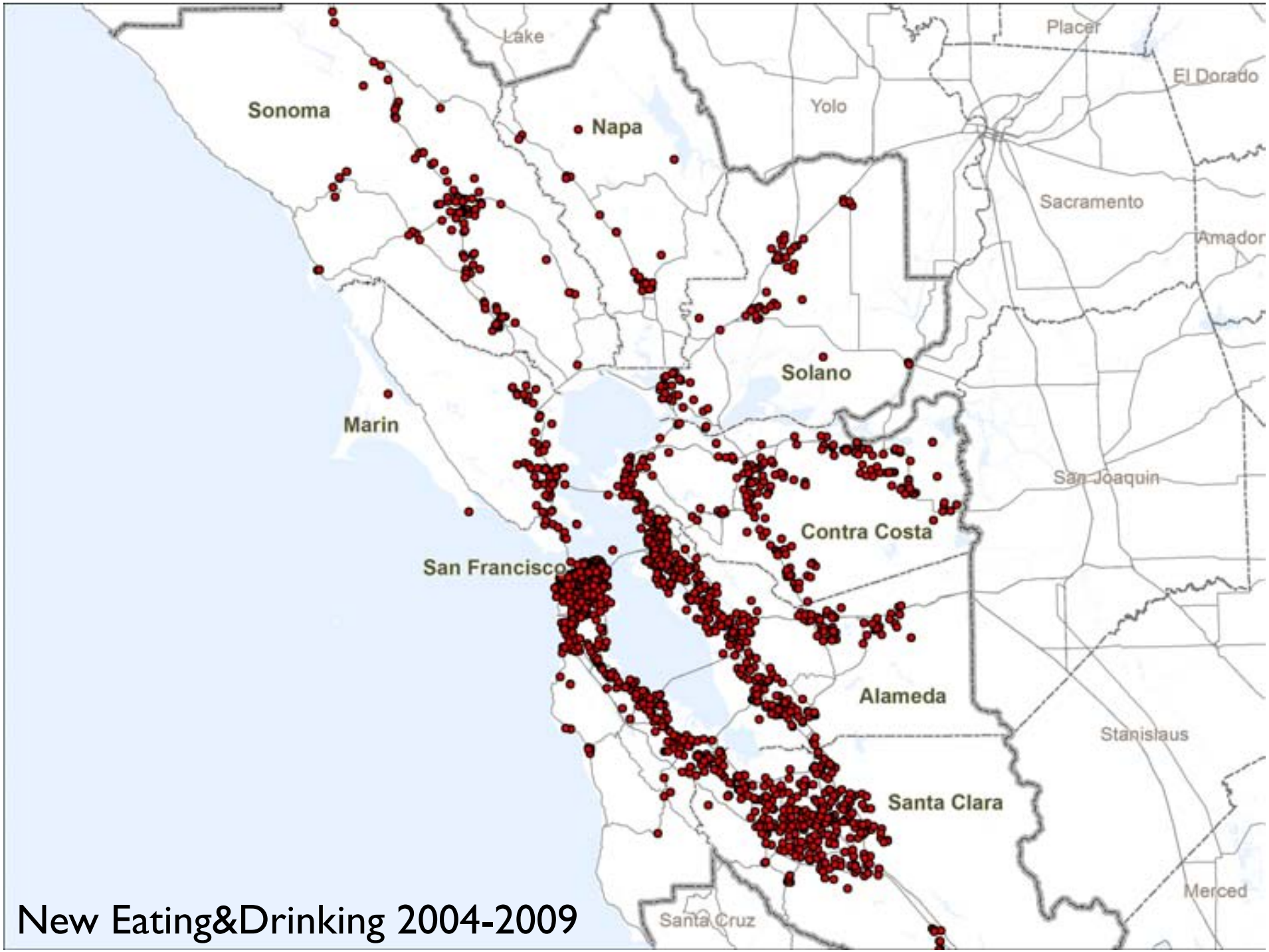
Kearny
Sansome
Battery
Front
Davis
Drumm
Spear
Don Chee
Pagoda
Sabin
Minna
Natoma
Annie
Stevenson
Jessie
Hunt
Clementina
Guy
Lansing
Gate

Analysis Sectors

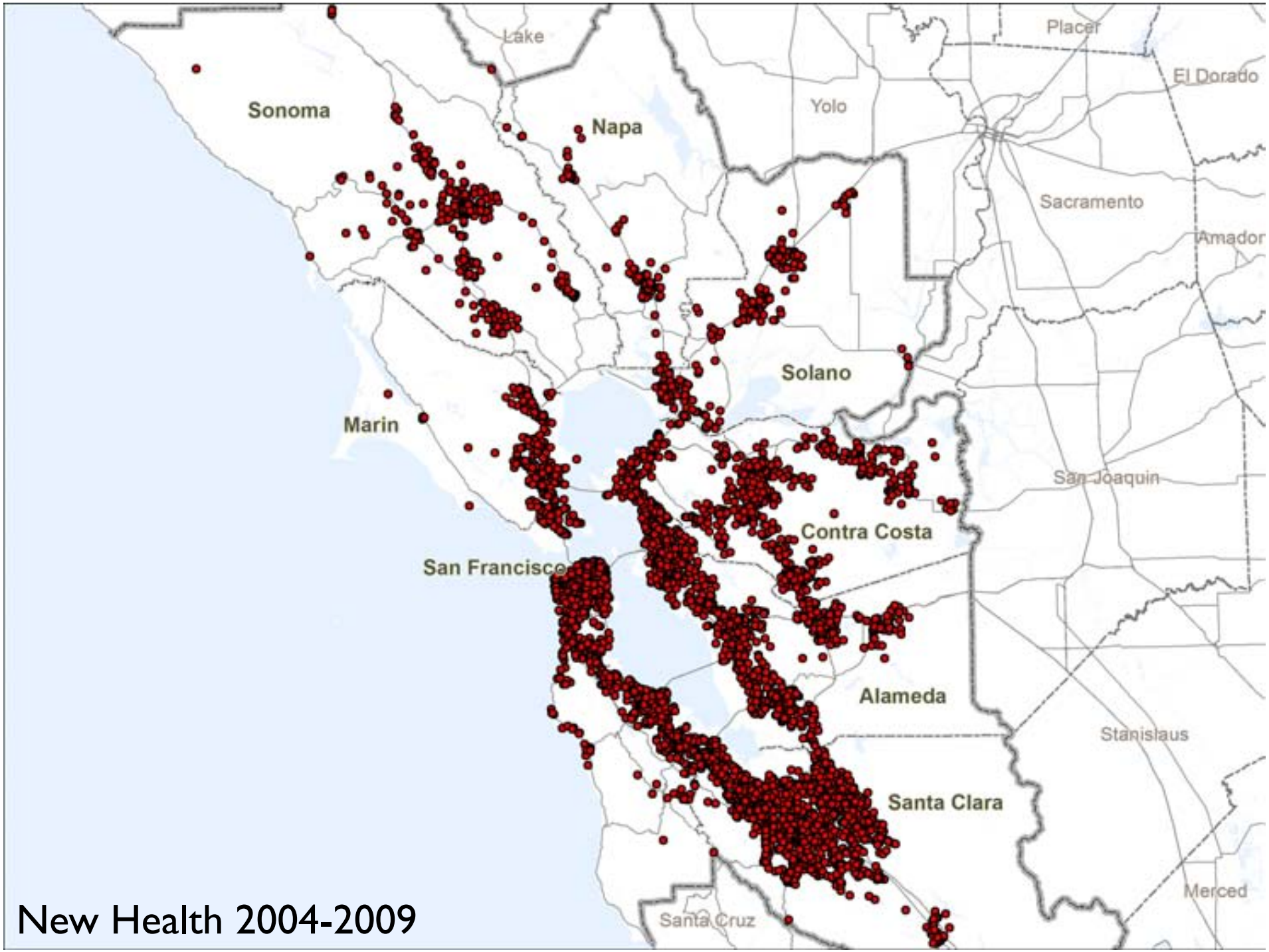
- Agriculture, Forestry, Hunting, Fishing
- Mining and Resource Extraction
- Construction
- Heavy Manufacturing
- Light Manufacturing
- High-Technology Manufacturing
- High-Technology Biological/Drug Manufacturing
- Logistics/Warehousing and Distribution
- Local-Serving Retail
- Regional Retail
- Transportation Services
- Utilities
- Information-Based Services
- FIRE
- Leasing
- Professional & Technical Services (General)
- Professional & Technical Services (Computers)
- Professional & Technical Services (Scientific R&D)
- Managerial Services, Administrative and Business Services
- Art & Recreation
- Hotels & Other Accommodations
- Eating & Drinking Places
- Personal & Other Services
- Healthcare
- Social Services & Childcare
- Educational Services: K12
- Colleges, Universities and Junior Colleges
- Other Schools, Libraries, and Educational Services
- Government
- Not classified



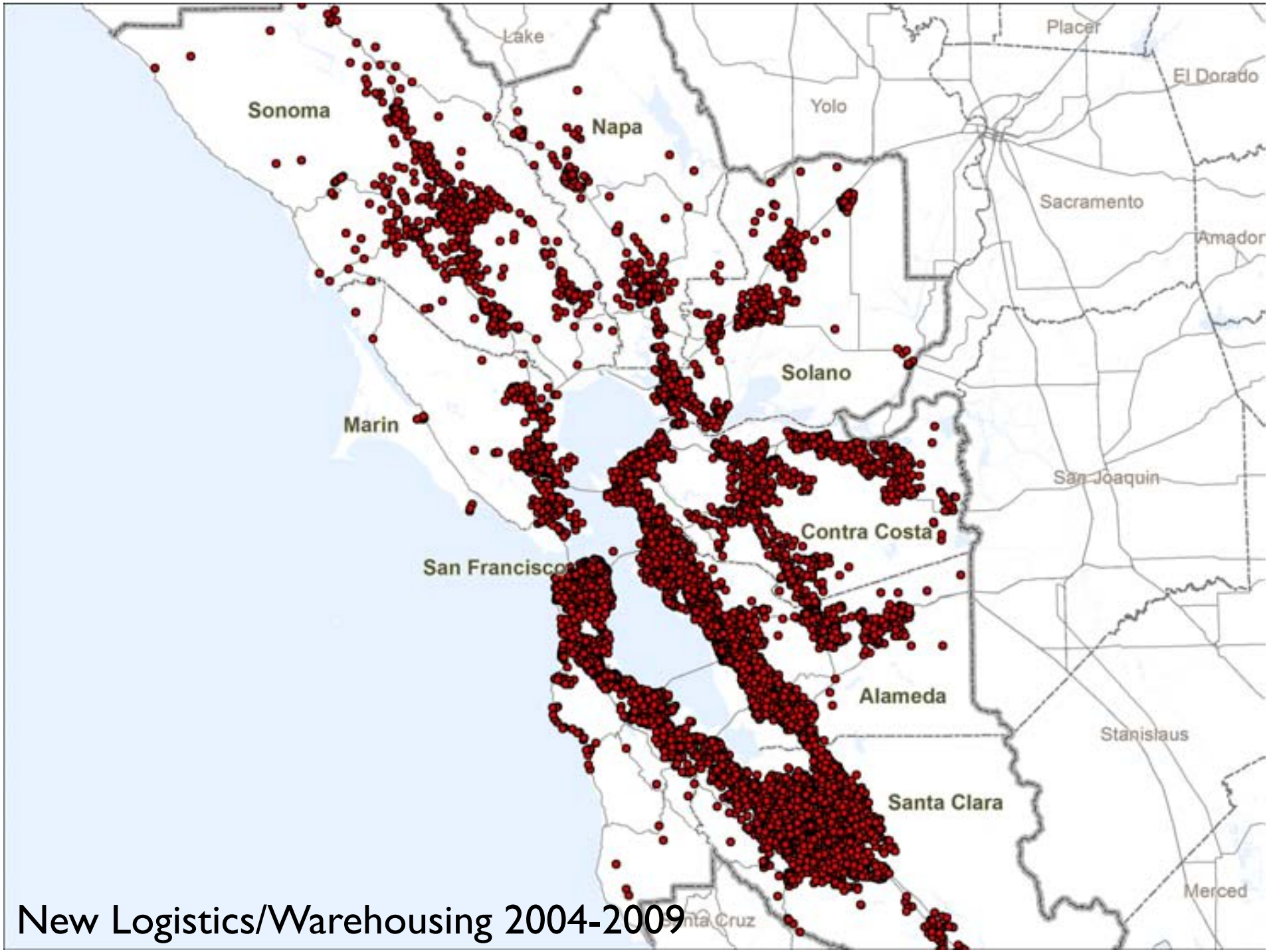
New Biotech 2004-2009



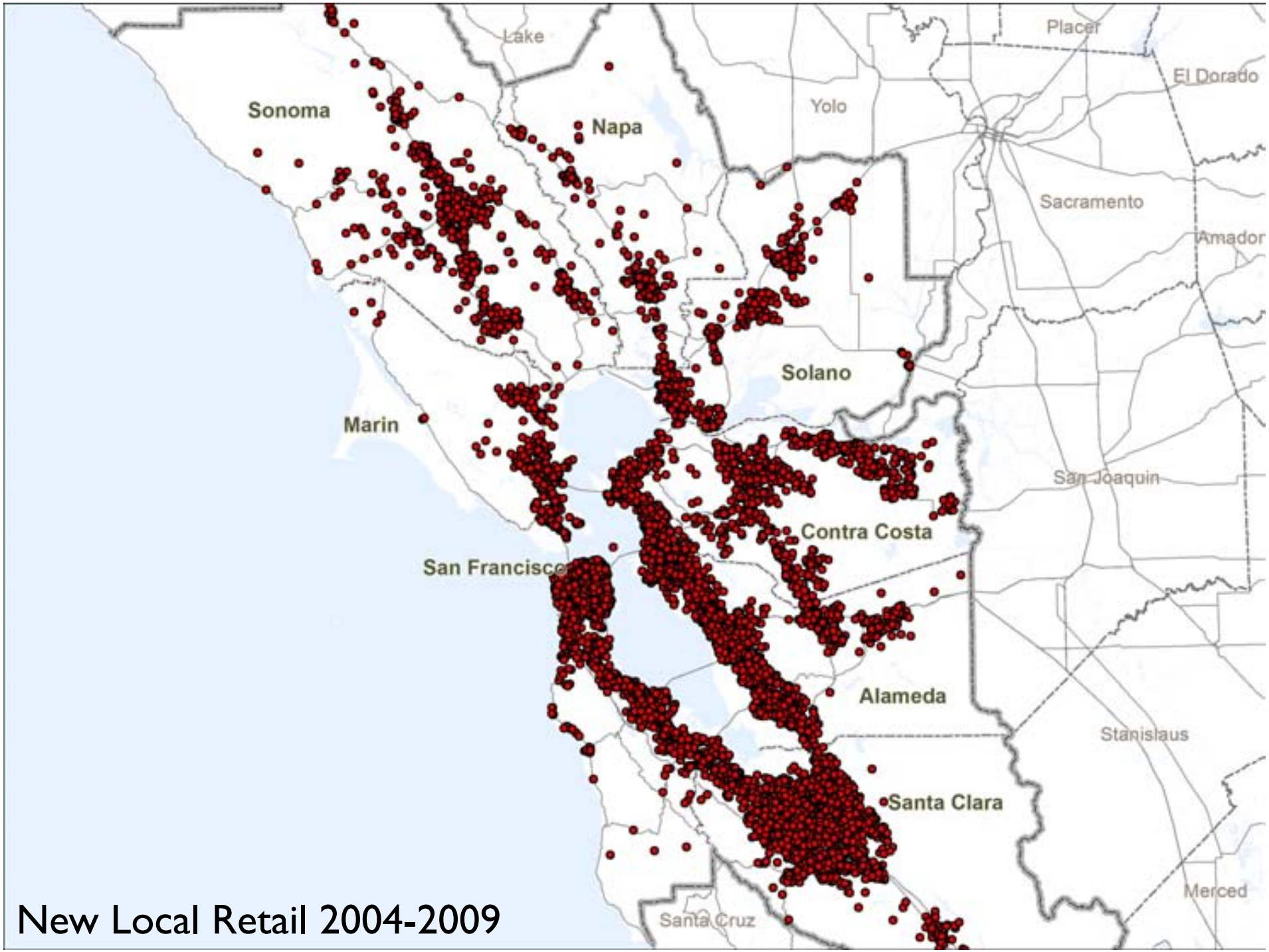
New Eating&Drinking 2004-2009



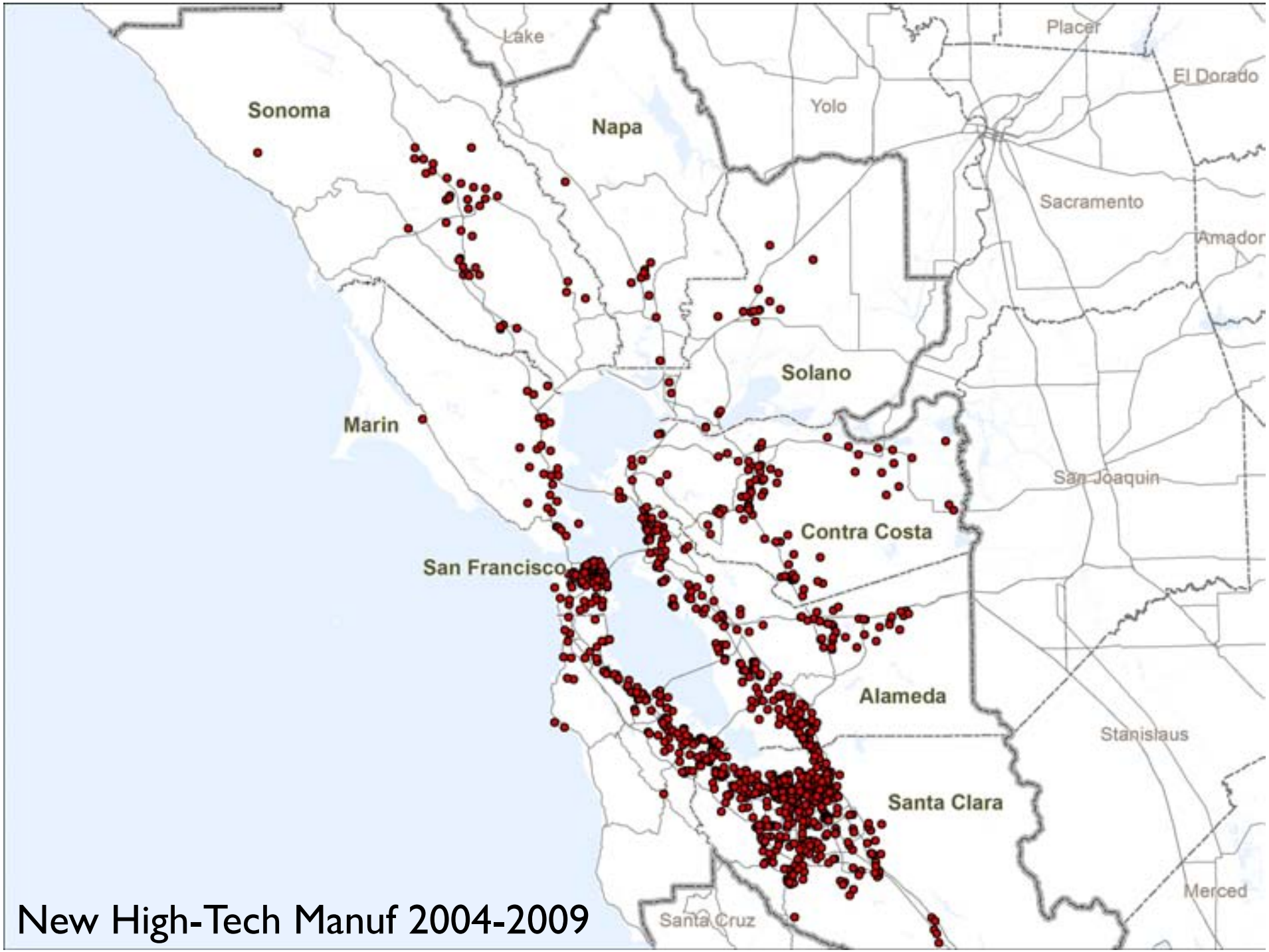
New Health 2004-2009



New Logistics/Warehousing 2004-2009



New Local Retail 2004-2009



New High-Tech Manuf 2004-2009

Discrete Choice Modeling

- Analysis of dataset over time performed using logistic regression (choosing a thing)
  - Earlier color ramps transformed into odds ratios (maybe twice as green = four times more likely a choice)
- A particular location has various attributes
  - These attributes and the interaction between them and the firm's attributes each influence the overall probability that the firm chose a site
- In the future, the attributes change but we assume their influence remains the same or changes in an explicit fashion

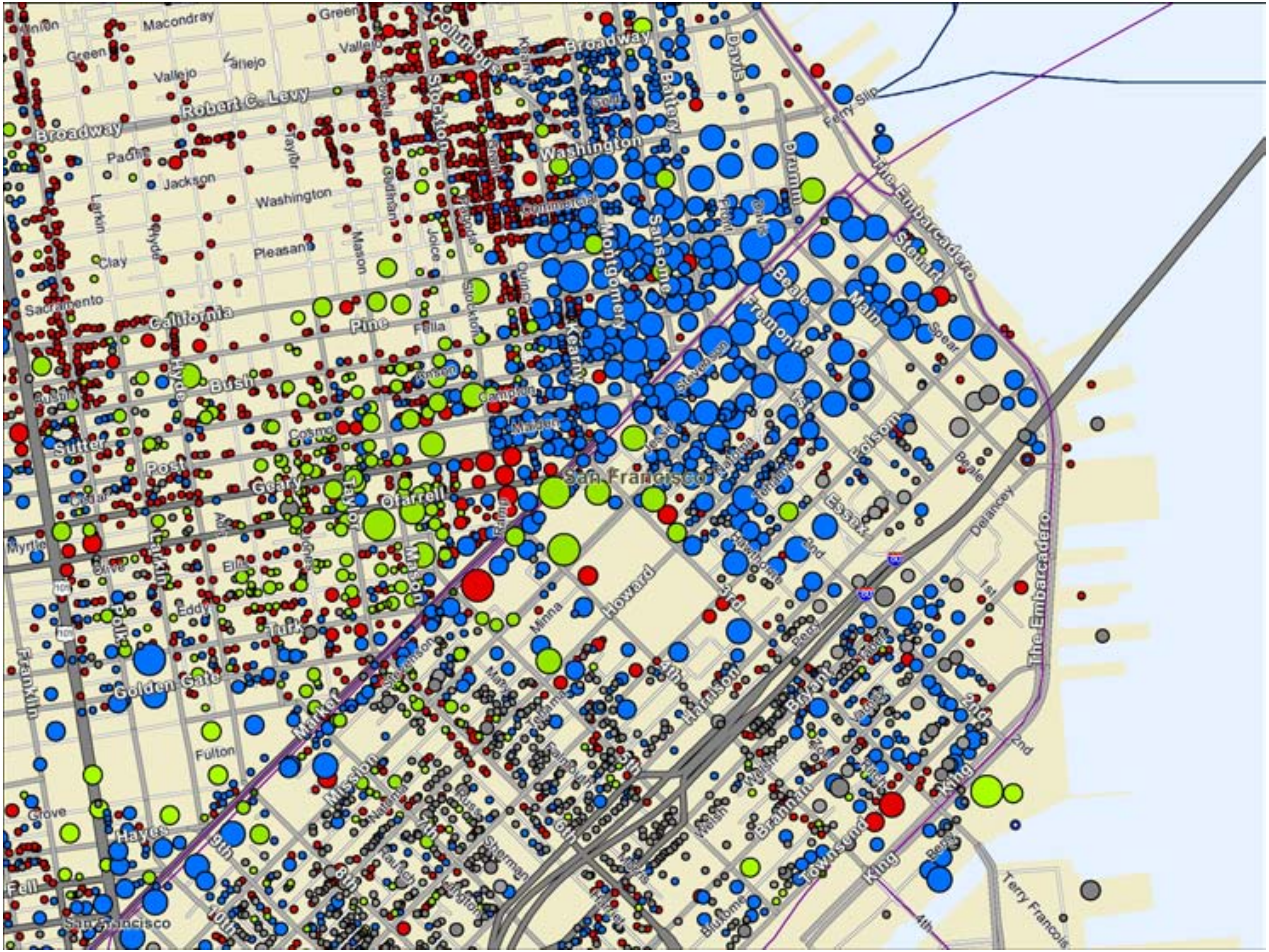
Monte-Carlo Simulation

- Steelhead treats each job as a separate entity and tracks it through time—each year:

1. Last round's desire for locations translates into prices that drive the real estate development model
2. A portion of jobs are relocated and jobs may enter or leave the economy
3. Statistical relationships are used to generate probabilities that a job is assigned to a just-vacated or just-built portion of a building
4. Jobs are stochastically assigned to a particular building until all jobs are located
5. This new distribution then influences the residential location choice models and future development and employment locations models

Supply Side

- Firm location choice = Demand
- Real estate development model = Supply
- Less important than with housing because to some degree Demand creates a building
- Using CoStar dataset (on parcels as well)
  - Current stock and use rates by type
  - Start of development template database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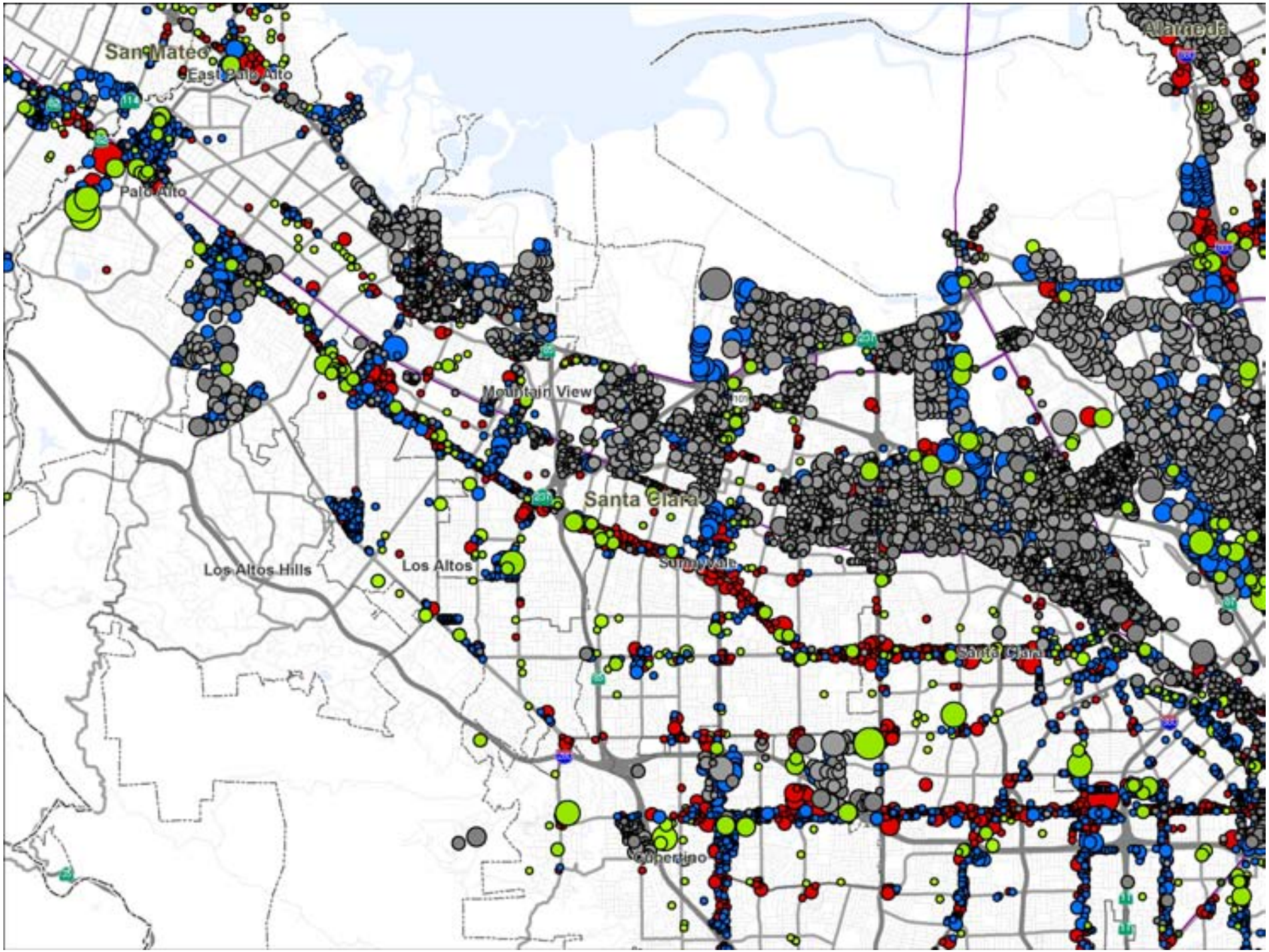
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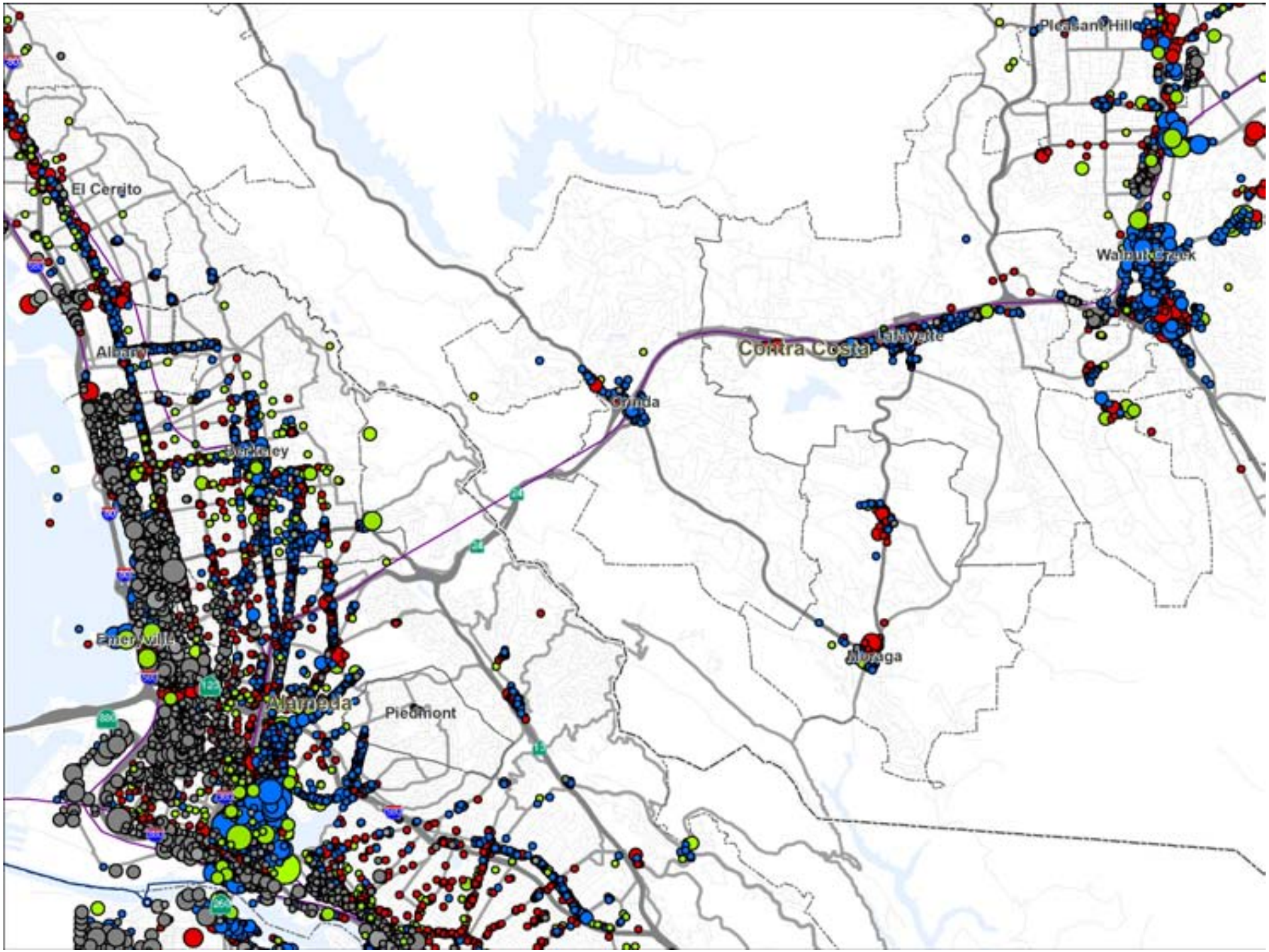
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Walnut Creek
Moraga

Policy Levers

- Not as many as housing
  - Land oversupplied so firms footloose
  - Tradition of low involvement in the economy
- Potential policies
  - Increasing the good stuff: transport linkages, housing provision (eg HK, Singapore, Europe)
  - VMT-generation tax
  - Residential densification
  - Jump-starting something

The Good Stuff

- BART's reach and overall experience (e.g. reliability) has allowed SF CBD to thrive
- Making sure the tech elite can live and work where they want to → CalTrain, the shuttles
- **Rapid** transit shrinks space and facilitates productivity-enhancing interaction
  - CA High Speed rail and its regional integration
- Providing enough reasonably priced housing (neighborhoods) within a reasonable commute

VMT-Generation Tax

- Impacts Supply Side (ie developers)
- Currently can only estimate from zonal variation in prices
- From September will be able to calculate explicitly
  - same with subsidies

Residential Densification

- From an older simpler model of 1998-2000
- An additional 100K residents within 25km make a "population-serving" firm 2-3% more likely to choose a location
  - need to try more local scale

Vacaville Regenerative Med Center

- Regional context: for every additional 10km from Palo Alto, a high-tech manufacturing firm is only 75% as likely to choose a location
  - we already know this and more
- For each additional 10K high-tech manuf workers within a 15-min congestion-free drive, a firm is 1.26 times as likely to choose a location
  - for R&D that goes up to 1.81 times
- So if planted 30K exogenous jobs → firm is 2 to 6 times more likely to locate nearby
  - will simulate in Steelhead to see what happens

Conclusions

- New Steelhead firm/employee model in place by mid-June
  - NETS and CoStar buildings
  - More sectors

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- Talk…

Broad Sectoral Characteristics

	Nearby Same-Sec	Regional Trajectory	Push Factor
FIRE&Law	++	+	–
Information	++		
R&D	+++		
Tech Manuf	++	+++	
Manuf	+	+	– –
Pop-Serving	+	+	+